JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATIONS-2022

B.Tech-VI Semester (Civil)

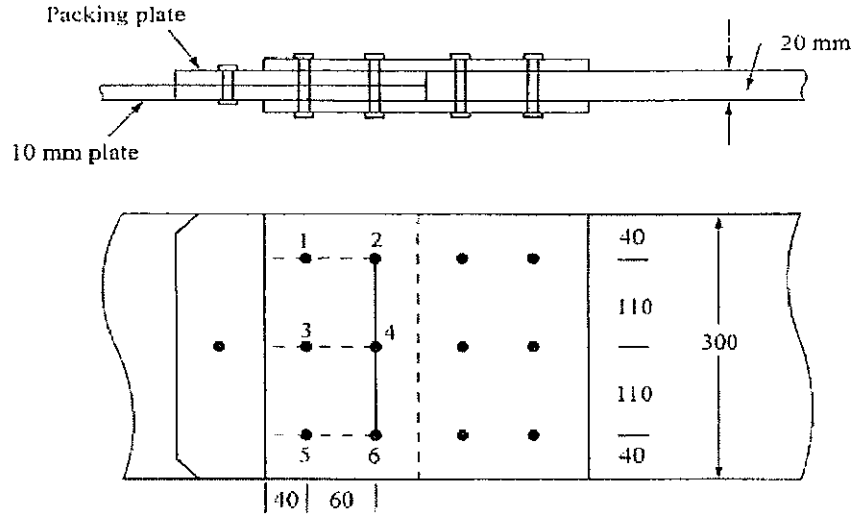
COURSE CODE (CREDITS): 18B17CE612 MAX. MARKS: 35

COURSE NAME: DESIGN OF STEEL STRUCTURES

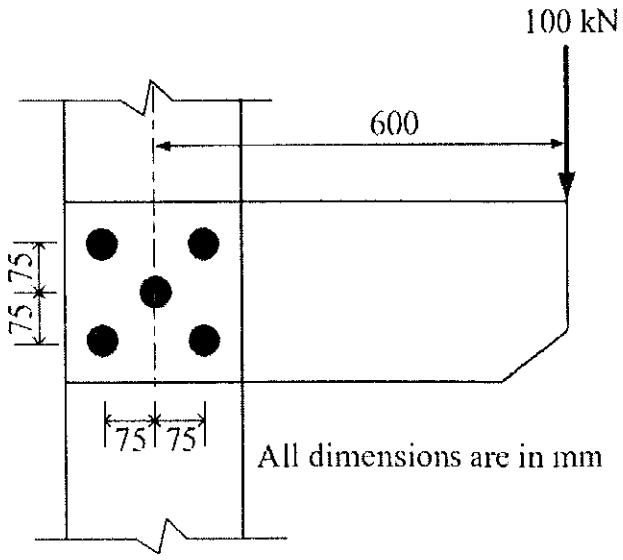
COURSE INSTRUCTORS: Mr. KAUSHAL KUMAR MAX. TIME: 2 Hours

Note: *All questions are compulsory. Marks are indicated against each question in square brackets.* ***IS-800:2000*** *and* ***IS-808:1989*** *are allowed. (Sharing of codes is strictly prohibited)*

Q1. A splice is being designed to connect a 300x20mm plate with a 300x10mm plate as shown in figure. 20 mm black bolts of grade 5.4 have been used. The design load this splice/connection can transfer? **[6 Marks]**



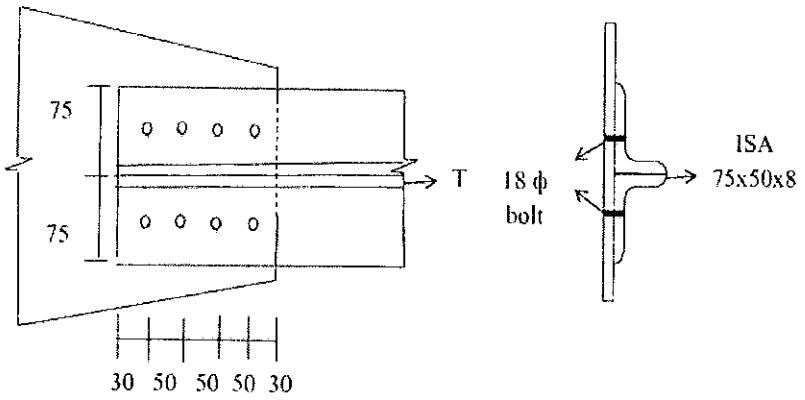
Q2. A bracket plate connected to a column flange transmits a load of 100 kN as shown in the figure. Find the maximum force for which the bolts should be designed? **[5 Marks]**



Q3. A tension member of a roof truss carries a factored axial tension of 400 KN. Design the section and its connection using ***lug angle***. **[7 Marks]**

[Hint: Use Steel Table/IS 808, to choose desired section]

Q4. Two ***ISA 75×50×8*** are connected to a gusset plate on its same side of thickness 10mm by four M18 grade 4.6 bolts. Find Block Shear strength of the angle if gusset is connected to the longer leg. **[5 Marks]**



Q5. Determine the *Design Axial load* on the column section ***ISMB 450 @ 710.3 N/m***, height of the column is 4 meter and is pin ended. Assume that fy = 250 MPa, fu = 410 MPa and E = 200000 MPa. **[5 Marks]**

Q6. A roof of a hall measuring 8 m × 12 m consists of 100 mm thick R. C. Slab supported on steel I-beams spaced 3 m apart as shown in Fig. below and are simply supported. The finishing load may be taken as 1.5 kN/m^2 and live load as 1.5 kN/m^2. Design the steel beam. **[7 Marks]**